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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,476	03/30/2004	Xiangyang Zhuang	CML01499M	4791
22917	7590	05/15/2007		
MOTOROLA, INC. 1303 EAST ALGONQUIN ROAD IL01/3RD SCHAUMBURG, IL 60196			EXAMINER HOM, SHICK C	
			ART UNIT	PAPER NUMBER
			2616	
			NOTIFICATION DATE	DELIVERY MODE
			05/15/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docketing.Schaumburg@motorola.com  
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**Office Action Summary**

Application No.

10/813,476

Applicant(s)

ZHUANG ET AL.

Examiner

Shick C. Hom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11-13, 15, 17-19, 22-24, 28 and 29 is/are rejected.
- 7) ☒ Claim(s) 7-10, 14, 16, 20-21, 25-27, 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 112***

2. Claims 1-10, 19-30, and 15-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 lines 3-4 which recite transmission on "a portion of a communication resource" and lines 6-7 which recite transmission on "at least the portion of the communication resource" is not clear as to whether the portion of a communication resource refers to the resource for constructing the same set of GCL sequences as seems to be suggested in page 10 lines 5-6 of the remarks or to the resource for transmitting the pilot sequence. The examiner will interpret the limitation as the resource for constructing the same set of GCL sequences being used to construct the first and second pilot sequence in this office action.

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***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 1-6, 11-13, 15, 17-19, 22-24, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mody et al. (2002/0181509) in view of Shi (2002/0009125).

Regarding claims 1, 11, and 15:

Mody et al. disclose the method for assigning a pilot sequence to communication units within a communication system, the method comprising the steps of: assigning a first communication unit a first pilot sequence for transmission on a portion of a communication resource, and assigning a second communication unit a second pilot sequence taken from the group of pilot sequences for transmission on at least the portion of the communication resource (paragraphs 0038-0041 recite providing pilot/training symbols to the preamble of the frame of the sub-channels, whereby the pilot/training symbols for each sub-channel being unique to the particular sub-channel and paragraph 0093 recite the training sequence structure is designed such that the same sequence is transmitted from all the transmitting antennas for the purpose of cross-correlation clearly reads on the same set of sequences being used to construct the first and second pilot sequence); and

utilizing the pilot sequence for at least one of the following: acquisition and tracking of timing and frequency

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synchronization, estimation and tracking of desired channels for subsequent demodulation and decoding, estimation and monitoring of characteristics of other channels for handoff purposes, and interference suppression (paragraph 0007 recite transmitting voice, data, video data frames having preamble at the beginning of the data frames in communication systems to a remote location for the purpose of synchronization as well as channel parameter estimation).

Regarding claims 2-4, 12-13:

Mody et al. disclose wherein the step of assigning the first communication unit the first pilot sequence comprises the step of assigning a first base unit, remote unit, or sector of a base station the first pilot sequence, and wherein the step of assigning the second communication unit the second pilot sequence comprises the step of assigning a second base unit, remote unit, or sector of a base station the second pilot sequence (see paragraph 0007 which recite transmitting to remote location clearly anticipate the base unit/station and remote unit and paragraph 0037 which recite using multiple sub-channels for transmitting over different frequency whereby orthogonality can be maintained clearly anticipate the assignment of the first and second pilot sequence to the first and second remote units as in claims 2-4).

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Regarding claim 5:

Mody et al. disclose wherein the step of assigning the first communication unit the first pilot sequence comprises the step of assigning a first antenna of a sector of the base station the first pilot sequence, and wherein the step of assigning the second communication unit the second pilot sequence comprises the step of assigning a second antenna of a sector of the base station the second pilot sequence (see paragraph 0052 which recite antennas for transmitting and receiving frame having the pilot symbols).

Regarding claim 6:

Mody et al. disclose performing the step of determining a length of the pilot sequences based on a number of pilot sequences needed in the communication system and a desired pilot sequence length (see paragraphs 0064-0066 which recite the symbol length being bases on  $N_T$  and determined by the designer).

Regarding claim 17:

Mody et al. disclose wherein a peak to average power ratio (PAPR) of the pilot channel sequence is lower than a PAPR of data transmitted over the data channel circuitry (see paragraph 0043 which recite low PAPR being used to form the training sequence).

Regarding claim 18:

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Mody et al. disclose wherein the pilot channel sequence is transmitted at a higher power than the data (see paragraph 0050 which recite the use of OFDM signal generally having a high average power ratio and must be backed off to prevent non-linear region).

Regarding claims 19 and 28:

Mody et al. disclose the use of a set of subcarriers wherein the first pilot sequence is assigned to a set of subcarriers in the frequency domain (paragraph 0093 recite the sub-carriers in the frequency domain).

Regarding claims 22-23:

Mody et al. disclose assigning a first and second antenna of the remote unit the first and second pilot sequences, respectively (Fig. 1 and the abstract recite the use of a number of antennas for transmitting).

Regarding claim 29:

Mody et al. disclose using different sequences for transmission at different times in a transmission frame (paragraph 0009 recite time and frequency synchronization of the sequence).

Mody et al. disclose all the subject matter of the claimed invention with the exception of the pilot sequences being constructed from the same set of GCl sequences via the same



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portions of a given communication resource as in claims 1, 11, 15, 24.

Shi et al. from the same or similar fields of endeavor teach that it is known to provide whereby the sequences being constructed from the same set of GCL sequences via the same portions of a given communication resource (paragraph 0020 recite parallel transmission of orthogonal sequences modulated using a chirp waveform clearly anticipate assigning a first and second communication unit a first and second sequence, respectively, and whereby the sequences are constructed from a set of Generalized Chirp-Like (GCL) sequences).

Thus, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide the pilot sequences being constructed from the same set of GCL sequences via the same portions of a given communication resource as taught by Shi et al. in the communications system of Mody et al.

The pilot sequences being constructed from the same set of GCL sequences via the same portions of a given communication resource can be implemented by providing the GCL sequence of Shi in the modulator of Mody et al. The motivation for using the GCL sequence as taught by Shi et al. in the communication system

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of Mody et al. being that it provides more efficiency for the system since the system can transmit at a higher bandwidth.

***Allowable Subject Matter***

5. Claims 7-10, 14, 16, 20-21, 25-27 and 30 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shick C. Hom whose telephone number is 571-272-3173. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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